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BUILDING CAPACITY FOR 21ST CENTURY ENGINEERING THROUGH CURRICULUM RENEWAL

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ABSTRACT

At the 2012 CDIO conference, it was clear to all that engineering for 21st Century challenges and opportunities will be critical to the success of society over the next 2-3 decades, in dealing with pressures including climate change, resource depletion and urban densification. Within this context there is a growing imperative for rapid curriculum renewal towards education for sustainable development across all types and disciplines of engineering education, around the world. Building on a paper presented by these authors at the 2012 CDIO conference, this 2013 roundtable will draw on participants' experiences to discuss how sustainability knowledge and skills can be embedded within a CDIO-based program using a holistic approach to curriculum renewal. The highly interactive and dynamic session will include two parts: 1) a short presentation from the chairs of the roundtable on an emergent model for rapid curriculum renewal; and 2) a facilitated discussion with participants about challenges and opportunities for action. Session notes will be recorded for distribution among participants following the conference.

KEYWORDS: sustainable development, rapid curriculum renewal

OBJECTIVES

1. To share opportunities for embedding sustainability into the curriculum
2. To empower participants with tools and ideas that they can use immediately within their institution

OUTLINE OF QUESTIONS

- ***How can engineering education develop 21st Century Engineers?*** Dr Desha will provide a short presentation on this question and present an emergent model that supports dynamic and deliberative curriculum renewal, based on a 2012 CDIO paper [1] and an upcoming text publication [2].
- ***How can CDIO support curriculum renewal for 21st Century Engineering?*** Associate Professor Dawes will provide a short presentation, reflecting on QUT's experiences as a CDIO university, in dynamic and deliberative curriculum renewal towards education for sustainable development.
- ***What experiences within the CDIO network can we learn from – challenges and opportunities?*** Through a facilitated discussion, participants will be invited to share their

experiences in curriculum renewal for sustainable development, within the CDIO framework. Challenges and opportunities will be documented for communicating with the larger CDIO community.

HANDOUTS TO ENGAGE THE AUDIENCE

The roundtable facilitators will provide participants with a handout at the roundtable, to promote discussion and provide information to support participants following the session.

REFERENCES

- [1] Desha C. and Hargroves K. "Engaging in a multiple-track approach to building capacity for 21st Century engineering, opportunities and challenges for rapid curriculum renewal", in *proceedings of the 2012 CDIO Conference*, 1-2 July, QUT, Australia, 2012.
- [2] Desha C., and Hargroves K., *Higher Education and Sustainable Development: A Model for Curriculum Renewal*, Taylor & Francis, London, *In Press*.

BIOGRAPHICAL INFORMATION

Cheryl Desha, Ph.D. is a Senior Lecturer in the Science and Engineering Faculty, Queensland University of Technology and a Principal Researcher with The Natural Edge Project (TNEP) research group, an academic network based in Australia. She has a degree in Engineering (Environmental, first class) and her doctorate (2010) was on the topic of rapid curriculum renewal. Dr Desha's research focuses on building capacity for sustainable development within tertiary education, for which she is co-authoring a text with TNEP colleague Karlson 'Charlie' Hargroves on *Higher Education and Sustainable Development* (in press, Taylor & Francis). This includes a model for rapid curriculum renewal and tools for its implementation.

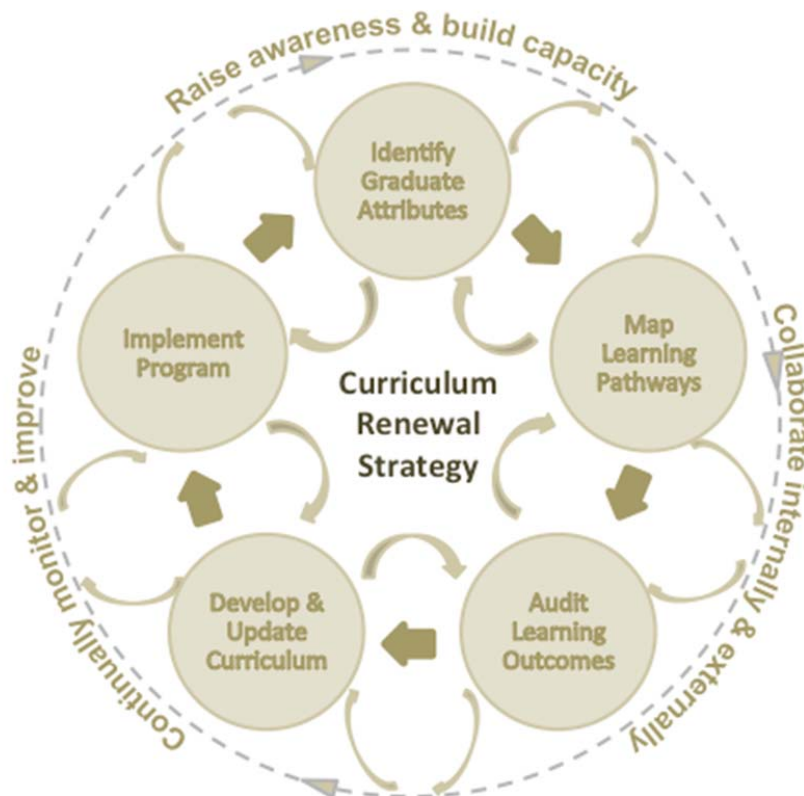
Les Dawes, Ph.D. is an Associate Professor in the Science and Engineering Faculty, Queensland University of Technology, immediate past president of the Australasian Association of Engineering Education and editor of the Australasian Journal of Engineering Education (AJEE). He continues to strive towards improving the quality, relevance and performance of engineering education along with the value of scholarship in engineering education. His research focus includes promoting the development and use of new teaching techniques and tools and promoting measurement of teaching effectiveness.

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Building Capacity for 21st Century Engineering Through Rapid Curriculum Renewal

Tuesday 11 June 2013 3:30 – 4.30PM, T4E Roundtable 202



Dynamic & Deliberative Model for Curriculum Renewal*

Roundtable Questions:

Considering the model and its various components:

1. *What experiences in the CDIO network can we learn from – barriers/ challenges in curriculum renewal for sustainable development?*
2. *What experiences in the CDIO network can we learn from – opportunities for curriculum renewal for sustainable development?*

* Desha, C. and Hargroves, K. (In Press) Higher Education & Sustainable Development: A Model for Curriculum Renewal, Taylor & Francis, London. www.naturaledgeproject.net